

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listing, of claims in the application:

Listing of Claims:

1. (Currently Amended) A spinal fixation system comprising:

a bone anchor member for being secured to a vertebral bone of the spine and having an enlarged head at one end thereof;

an elongate member for extending generally along the spine;

a coupling device for securing the elongate member relative to the bone anchor member;

a seat of the coupling device having a bore about which the seat extends and sized to allow the anchor member to extend through the bore in a plurality of orientations with the head engaged against the seat;

a cam lock member of the coupling device having a cam surface which cooperates to push the elongate member downward with the cam lock member being fixed against translation during turning thereof for clamping the head of the anchor member against the seat to fix the anchor member in one of the orientations thereof with the elongate member secured between the cam lock member and the anchor member head, wherein the elongate member is a spinal rod having a convexly curved surface, the cam surface of the cam lock member is a bottom surface thereof that includes is formed by a concave surface portion and ramp surface portions on either side of the concave surface portion so that both the concave surface portion and the ramp surface portions face downwardly toward the spinal rod; and

a saddle member of the coupling device including an upper cam surface and a lower concave surface with the upper cam surface configured to cammingly engage the cam lock member bottom surface to cooperate ~~with the cam surface portions of the cam lock member~~

therewith upon turning of the cam lock member for driving the lower concave surface into tight fitting engagement on the rod surface.

2-11. (Canceled).

12. (Previously Presented) The spinal fixation system of claim 1 wherein the coupling device includes walls extending upward from the seat by a predetermined distance with the camming between the cam lock member and the saddle member allowing the predetermined distance to be minimized for providing a low profile for the coupling device.

13. (Previously Presented) A spinal fixation system for fixing a spinal rod in a desired position relative to a patient's spine, the spinal fixation system comprising:

a bone anchor member for being secured to a vertebral bone of the spine;

a head at the proximal end of the anchor member having an upper recessed surface and a lower generally arcuate external surface;

a coupling member for receiving the spinal rod and including an internal seat surface and a central bore sized to allow the anchor member to extend therethrough in a plurality of different orientations with the arcuate external surface of the head bearing on the internal seat surface of the coupling member to allow the anchor member head to shift thereon;

a low profile insert having a substantially flat upper surface for engaging the spinal rod and an arcuate lower surface for adjustably bearing against the recessed surface of the anchor member head with the insert sized so that the upper surface thereof projects only slightly beyond the anchor member head to keep the profile of the insert to a minimum;

a clamping member that clamps the rod against the flat insert surface to fix the anchor member head against the seat surface with the anchor member in one of the different orientations thereof, wherein the insert upper surface is narrower than the insert arcuate lower surface, the insert includes a shoulder between the upper and lower surfaces thereof; and

staked portions of the anchor member head that are fixed in interference with the insert shoulder to retain the insert in the head recess and spaced from the shoulder to allow pivoting of the insert in the head recess.

14-19. (Canceled).

20. (Original) The spinal fixation system of claim 13 wherein the clamping member comprises a saddle member having an upper cam surface, and

a cam lock member axially adjustably connected to the saddle member and having a lower cam surface that cooperates with the saddle upper cam surface so that turning of the cam lock member toward a locked position thereof drives the saddle member axially toward the rod with the cam lock member staying axially fixed.

21. (Currently Amended) A spinal fixation system comprising:

a bone anchor member;

a spinal rod having a curved external surface;

a coupling device for securing the spinal rod relative to the bone anchor member;

a cam lock member;

opposite laterally spaced openings of the coupling device through which the spinal rod extends with the bone anchor member extending transverse to the rod; and

a bottom cam surface of the cam lock member that ~~cooperates with~~ cammingly engages the rod curved surface to cooperate therewith such that turning of the cam lock member rotates the bottom cam surface on the rod curved surface and causes the rod to be pushed downwardly toward the bone anchor member for being fixed in position relative thereto.

22-23. (Canceled).

24. (Original) The spinal fixation system of claim 21 further including a low profile anvil, wherein the bone anchor member includes a head with a recess formed therein, the recess receiving the low profile anvil therein.

25. (Original) The spinal fixation system of claim 24 wherein the low profile anvil has a top surface for engaging the external surface of the spinal rod, and the anvil is shiftable within the recess to orient the top surface of the anvil against the external surface of the spinal rod.

26. (Original) The spinal fixation system of claim 24 wherein the anvil is fashioned from a sphere so as to have a spherical portion received in and shiftable against the recess and to have a top surface positioned less than a full radius from the center of rotation of the anvil.

27-28. (Canceled).

29. (Previously Presented) The spinal fixation system of claim 21 wherein the bone anchor member is integral with the coupling device.

30. (Previously Presented) A spinal fixation system for fixing an elongate member in a desired position relative to a patient's spine, the spinal fixation system comprising:

a bone anchor member for being secured to a vertebral bone of the spine;

a coupling member having an axis and an internal space for receiving the spinal rod extending therethrough in a direction transverse to the coupling member axis;

a cap member for being turned about the coupling member axis to a locked position thereof and locking the elongate member in the coupling member, the cap member having a bottom cam surface;

a saddle member disposed between the cap member and the elongate member for being tightly engaged against the elongate member with the cap member in the locked position, the saddle member having an upper cam surface;

a connector member distinct from the cap member and the saddle member for keeping the cap member and saddle member assembled together and allowing the saddle member to shift axially along the coupling member axis upon turning of the cap member; and

the bottom cam surface of the cap member and the upper cam surface of the saddle member being configured to cammingly engage each other so that turning of the cap member toward the locked position causes the saddle member to be driven axially toward the elongate member without requiring axial movement of the cap member.

31. (Original) The spinal fixation system of claim 30 wherein the connector member comprises a spring clip member.

32. (Original) The spinal fixation system of claim 30 wherein the cap member includes a central opening, and the connector includes flexible spaced prongs that resiliently deform toward each other as the prongs are inserted in the cap member central opening to permit assembly of the cap and saddle members together.

33. (Original) The spinal fixation system of claim 30 wherein the connector member includes an axially intermediate cam portion that frictionally holds the cap member and the saddle member closely adjacent to each other and allows the saddle member to shift axially relative to the cap member as the cap member is turned.

34. (Original) The spinal fixation system of claim 30 wherein the coupling member comprises a pair of spaced sidewalls having internal recesses therein, and the cap member includes

radial flanges for being received in the recesses to keep the cap member axially fixed as the cap member is turned to the locked position thereof.

35. (Canceled).

36. (Previously Presented) The spinal fixation system of claim 30 wherein the upper surface of the saddle member has an elongate configuration extending within the internal space of the coupling member.

37. (Original) The spinal fixation system of claim 30 wherein the coupling member and the cap member have detents therebetween to provide a tactile indication of different rotary positions of the cap member during turning thereof.